THE PROBLEM OF RICKETS

The British Paediatric Association in a six-page printed memorandum on rickets, which has been issued by the Ministry of Health and the Department of Health for Scotland to medical officers of health for the information of their medical staff, health visitors, midwives, and district nurses, finds that rickets as a general cause of ill-health among babies in England is now nothing like what it was of old ; in fact it is no longer a common disease in this country. At the same time rickets is preventable, and therefore there is no reason why it should occur at all. It is the duty of all who are concerned with children to see that it disappears completely.

The memorandum is arranged under three main headings: aetiology, diagnosis, prophylaxis and treatment. In view of the fact that in the British Isles, owing to a relative lack of sunshine, rickets—a metabolic disorder—must be regarded as primarily a nutritional problem, the memorandum stresses that if a deficiency of vitamin D is avoided the condition will not occur. It has been established by scientific evidence that vitamin D supplied in adequate amounts will prevent rickets. If the disease is actually present it can be cured by supplying vitamin D, thus overcoming the deficiency which has caused it

Diagnostic Difficulties

The diagnosis of rickets presents problems which are discussed at some length. The gross findings so commonly met with in bygone times are rare to-day, and whereas the diagnosis was formerly easy because of the florid form in which the disease presented itself, the clinical diagnosis is apt to be extremely difficult now, owing to the mild signs present in the stage at which it is desirable to detect the disorder and prevent its further development. Where only minor degrees of bony change exist, clinical diagnosis of rickets may be impossible. Can radiology solve the problem, and if so to what extent? "Certainly radiology is of great help and has become increasingly important in the recognition of the milder types of the disease now encountered, but it must not be used to the exclusion of clinical examination. . . . For diagnostic purposes a careful history and clinical examination, together with *x*-ray investigation, while not yet yielding perfect results, will give the most useful information that can generally be obtained at the present time ; but this should be supplemented in doubtful cases, whenever possible, by an estimation of the blood phosphatase, for the limitations of both clinical and *x*-ray examinations must not be lost sight of."

Prophylaxis and Treatment

While the diagnosis of rickets is clearly not easy, its prevention and treatment give rise to no particular difficulties, and are in fact simple. To guard against dietary deficiencies, and because breast-feeding is no certain preventive of rickets, the memorandum recommends that babies, however fed, should receive a supplement of vitamin D. Pointing out that, broadly speaking, a daily intake of 500 to 800 international units of vitamin D should prevent rickets throughout infancy, it mentions that cod-liver oil *B.P.* contains 330 i.u. per drachm, while the Ministry of Food's cod-liver-oil compound contains 750 per drachm. "A cod-liver-oil and malt mixture should not be employed as a prophylactic measure against rickets. Its actual content of cod-liver oil, and therefore of vitamin D, is usually small, and it only engenders a sense of false security. For the same reason it should be remembered that cod-liver-oil emulsions contain only 30 to 50% of actual cod-liver oil."

Rickets can occur in a baby before its birth, when the diet of the mother is of vital importance for the child, but the disease is more frequently found in the early years of life, when growth is more rapid. The fact that rickets can be completely avoided by the proper use of simple preventive measures goes far to offset the difficulties associated with diagnosis. In treating active rickets ultra-violet irradiation could be combined, when practicable, with oral administration of vitamin D, the latter in larger doses than when employed for prophylaxis. The carbon-arc lamp is at present by far the most satisfactory source of ultra-violet light for treatment of rickets. Infants who have started to walk should be kept off their feet during the first three or four weeks of treatment.

The memorandum recalls that a special inquiry, carried out by the British Paediatric Association by arrangement with the Ministry and the Department during the war, yielded no evidence that wartime conditions had given rise to an increase of rickets.

THE DISCOVERY OF X RAYS

RÖNTGEN AND PURE SCIENCE

The commemoration of the fiftieth anniversary of Röntgen's discovery of *x* rays[1] was continued in a joint meeting of all participating societies which was addressed by Sir Lawrence Bragg, with Sir Henry Dale, P.R.S., presiding. Sir Lawrence Bragg spoke of Röntgen's discovery in relation to pure science. He quoted from a speech by Sir J. J. Thomson in 1916 at the foundation of the Department of Scientific and Industrial Research, in which he had pointed out that *x* rays were not discovered as the result of research in applied science but of research in pure science, made with the object of discovering the nature of electricity. The experiments which led to the discovery seemed as remote from humanistic interest as could be imagined. Research on the lines of applied science would doubtless have led to an improvement and development of older methods, but research in pure science led to an entirely new and much more powerful method. To use J. J. Thomson's words, applied science led to reform, pure science to revolution. Röntgen's discovery of "rays which I will call *x* rays for short"—to quote Röntgen's original paper—was no chance hitting on something which might have been rather different ; the only possible condition in which *x* rays could have been produced was the condition of a discharge tube where the electrons had a long run, a high potential of 50,000 volts or so, and something for the electrons to hit at the end so that they produced the ray. Sir Lawrence Bragg said that he had no idea until he came to read Röntgen's original paper how far he went and how ingenious he was in that contribution. One of the first consequences of Röntgen's discovery was the stimulus it gave to researchers at Cambridge—Rutherford and others—on the ionization of gases which led to the new physics and the work on the structure of the nucleus and all that had resulted therefrom. It was difficult to think of another single discovery which had led to such vast results.

Other commemorations in London during the second week of November took place under the auspices of the Royal Society, the Royal College of Surgeons of England, the Section of Radiology of the Royal Society of Medicine, and the Institution of Electrical Engineers. Most of the addresses delivered were in reminiscent vein.

JUBILEE LECTURE IN EDINBURGH

The discovery and early history of investigation of *x* rays was the subject of the first of four Keith lectures delivered in the University of Edinburgh on Nov. 12 by Prof. Norman Feather. The course was arranged by the Royal Scottish Society of Arts to mark the jubilee of the discovery of *x* rays. The other lecturers are Dr. Robert M'Whirter, Edinburgh, and Prof. G. D. Preston, Dundee.

Prof. Feather, after discussing the investigation of the phenomena involved in the passage of electricity through rarefied gases from the time of Faraday onwards, said that in 1895 Röntgen discovered a new and quite distinct effect outside a cathode-ray tube: an invisible radiation proceeding in straight lines from the points of impact of the cathode rays on the wall of the tube, capable of affecting a photographic plate or a fluorescent screen and of throwing partial shadows of solid objects placed in its path. Röntgen discovered this phenomenon as it were accidentally, but he was fully aware of the importance of his discovery. From the point of view of pure physics the outstanding contributions at that stage came from Cambridge. J. J. Thomson and M'Clelland discovered the ionizing power of the rays, and Thomson and Rutherford, as the result of a brilliant series of experiments, within a few months formulated the basic ideas which were still used in all discussions of gaseous conduction. Then Thomson, more fully than, but perhaps not quite so early as, certain Continental physicists, established the nature of the cathode rays (1897), and Stokes put forward a theory, which was recognized as essentially correct to-day, of the mode of production of *x* rays by the impact of the cathode rays on matter.

[1] See *British Medical Journal*, Nov. 17 1945, p. 699.